

Claims

1. Alloy, in particular for an anti-friction coating, comprising elements which form a matrix (2) and at least a soft phase (3) and/or a hard phase (5), which soft phase elements and/or hard phase elements form a solid solution or a bond with the matrix element, wherein the soft phase (3) and/or the hard phase (5) is dispersed in the matrix (2) and the solid solution or bond is formed only in the region of the phase boundary (4) of the matrix (2) with the soft phase (3) and/or with the hard phase (5).
2. Alloy as claimed in claim 1, wherein the mean particle size of the dispersed soft phase (3) and/or hard phase (5) is $1\mu\text{m}$ to $100\mu\text{m}$, preferably $5\mu\text{m}$ to $20\mu\text{m}$.
3. Alloy as claimed in claim 1 or 2, wherein the region of the phase boundary (4) in which the solid solution or bond is formed has an average thickness in the range of between $0.1\mu\text{m}$ and $3\mu\text{m}$, preferably between $0.5\mu\text{m}$ and $2.5\mu\text{m}$.
4. Alloy as claimed in one of claims 1 to 3, wherein the matrix element is selected from a group comprising aluminium, chromium, copper, magnesium, manganese, molybdenum, nickel, silicon, tin, titanium, tungsten and zinc, and the soft phase element is different from the matrix element.
5. Alloy as claimed in claim 4, wherein the proportion of matrix element is at least 55 % by weight, in particular at least 65 % by weight.
6. Alloy as claimed in one of the preceding claims, wherein the soft phase (3) is at least one element selected from an element group comprising silver, aluminium, gold, bismuth, carbon (graphite), calcium, copper, indium, magnesium, lead, palladium, platinum, scandium, tin, yttrium, zinc and lanthanoids, and the soft phase element is different from the matrix element.
7. Alloy as claimed in one of claims 1 to 5, wherein the soft phase (3) is selected from a group comprising MoS_2 , PTFE, silicone, barium sulphate and mixtures thereof.

8. Alloy as claimed in claim 6 or 7, wherein the proportion of soft phase is in the range of between 10 % by weight and 45 % by weight, in particular between 15 % by weight and 35 % by weight.
9. Alloy as claimed in one of claims 1 to 8, wherein the hard phase (5) is at least one element selected from an element group comprising boron, carbon (diamond), cobalt, hafnium, iridium, molybdenum, niobium, osmium, rhenium, rhodium, ruthenium, silicon, tantalum, tungsten and zirconium, and the hard phase element is different from the matrix element.
10. Alloy as claimed in one of claims 1 to 8, wherein the hard phase (5) is selected from a group comprising ZnS_2 , BN, WS_2 , carbides such as for example SiC, WC, B_4C , oxides, such as for example MgO, TiO_2 , ZrO_2 , Al_2O_3 , and mixtures thereof.
11. Alloy as claimed in claim 9 or 10, wherein the proportion of hard phase is in the range of between 3 % by weight and 25 % by weight, in particular between 5 % by weight and 20 % by weight.
12. Anti-friction coating, in particular a bearing anti-friction coating, made from an alloy, wherein the alloy is as claimed in one or more of the preceding claims.
13. Composite material comprising at least a first peripheral coating (8) and a second peripheral coating (9) disposed on top of it, for example a supporting layer made from steel, in particular for anti-friction bearings or thrust washers, wherein the first peripheral coating (8) is formed by an anti-friction coating as claimed in claim 12.
14. Composite material as claimed in claim 13, wherein an additional coating is provided between the first peripheral coating (8) and the second peripheral coating (9) in the form of a diffusion barrier or adhesion coating.
15. Method of producing a composite material comprising at least a first peripheral coating (8) and a second peripheral coating (9) disposed on top of it, in particular for anti-friction bearings or thrust washers, wherein an alloy as claimed in one of claims 1 to 10 is produced

as a first peripheral coating (8) by means of a cold gas spraying process.

16. Method as claimed in claim 15, wherein the second peripheral coating (9) is formed by a supporting layer, made from steel for example, and the first peripheral coating (8) is sprayed on top of it.

17. Method as claimed in claim 15 or 16, wherein an additional coating is provided between the first peripheral coating (8) and the second peripheral coating (9) in the form of a diffusion barrier or adhesion coating and it is sprayed on top of the second peripheral coating (9).

18. Method as claimed in one of claims 15 to 17, wherein the process gas is selected from a group comprising helium, argon, nitrogen, and mixtures thereof.

19. Method as claimed in claim 18, wherein the gas temperature is selected from a range of between 60% and 95 % of the melting temperature of the alloy element with the lowest melting temperature.

20. Method as claimed in claim 18, wherein the gas temperature is selected from a range of between 65% and 90%, preferably between 70% and 85%, of the melting temperature of the alloy element with the lowest melting temperature.

21. Method as claimed in claim 18; wherein the gas temperature is selected from a range of between 95% and 130% of the melting temperature of the alloy element with the lowest melting temperature.

22. Method as claimed in one of claims 15 to 21, wherein a separate cold gas spraying system is provided for each alloy element used and for each phase.

23. Method as claimed in one of claims 15 to 22, wherein the initial powder used for spraying has a particle diameter in the range of from 3 μm to 70 μm , preferably from 5 μm to 55 μm .

24. Use of the alloy as claimed in one of claims 1 to 11 to produce an anti-friction coating of an anti-friction bearing.
25. Use of the alloy as claimed in one of claims 1 to 11 to produce a thrust washer.
26. Use of the alloy as claimed in one of claims 1 to 11 to produce directly coated bearing components, for example cans.